

Relevance of Disease Profiling in Pharma: A
Comparative Study Between 2004 and 2014 Done on
Geriatric Individuals

By

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The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific and analytical. The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.



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This is to certify that the dissertation titled **“Relevance of Disease Profiling in Pharma: A comparative study between 2004 and 2014 done on geriatric individuals”** and submitted by Kush Dua, Enrollment No. IIHMR-U/02/2014-2016/0019 under the supervision of Dr. Monika Chaudhary for award of Masters in Business Administration- Hospital and Health Management of the University carried out during the period from 4th February, 2016 to 16th May, 2016 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.



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Abstract
**Relevance of Disease Profiling in Pharma: A comparative study between
2004 and 2014 done on geriatric individuals.**

Submitted By – Kush Dua

Submitted To – Dr. Monika Chaudhary

Disease profiling in pharmaceutical industry has wide spread applications such as tracking, forecasting, segmenting, pricing, market research etc. using parameters such as Hospital Inpatient Profile, Hospital Outpatient Profile, Disease prevalence and incidence, paying capacity of the individuals etc. Around 135 pharmaceutical and biotech companies around the globe are developing 294 medicines specifically aimed at elderly disorders. The population over 60 years of age has tripled in last 50 years in India. Decline in the young population proportion along-with increased life span of individuals due to reduced fertility and mortality rate has led to an increased elderly people proportion in the total population. India is becoming an ageing nation.

Old age is characterised by irreversible physical and cognitive changes and the person becomes vulnerable to various disease, syndromes, and sickness. Non-communicable diseases which are mainly chronic in nature are becoming more prevalent in the middle or old aged individuals after a prolonged exposure to an unhealthy lifestyle relating mainly to economic transition, rapid urbanization and 21st-century lifestyle.

Prevalence of various ailments amongst elderly and middle aged population has a significant influence on their physical and psychological well-being. The study was done with an objective of studying the transition of the disease pattern leading to the hospitalization of the pre-geriatric and geriatric age group. Data was analysed from 60th round, schedule 25 of National Sample Survey and 71st round, schedule 25 of National Sample Survey. Individuals who had undergone hospitalization in last 365 days prior to start of the surveys were taken as the sample.

The study reveals that infectious diseases have decreased, which may be because of a better public health intervention in health care over a period of ten years. But there is a consequential increase in the burden due to Non-Communicable diseases. Mental and neurological ailments, respiratory disorders, Lifestyle disorders and injuries are one of the major concerns. As urbanisation has increased and paying capacity of individuals have increased, it indicates new and emerging markets for pharmaceutical sector. This study can be useful in also designing the marketing strategy.

Keywords: Geriatric, In-patient, Disease profile, Non-Communicable diseases, Pharmaceutical

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1. Introduction:

1.1 Disease Profiling and Pharmaceutical Industry

Healthcare data is regularly utilized in the pharmaceutical industry by market research groups for tracking and forecasting purposes. The disease profile in terms of the out-patient consultations and in-patient admissions reveals volume about the unmet health needs market segments (existing and emerging), need for health interventions, efficacy of existing interventions, and demographic as well as economic profiles of individuals nationwide.(Sharon Srodin, 2006)

The number of elderly people is rising dramatically and is expected to continue rising even more in the next couple of decades. The boom in the ageing population will increase the demand for efficacious, safe and affordable medicines enormously.(Szucs, 2001) If the underlying processes of ageing and the age-depended disorders are known, it will be easier to develop therapies and to keep the elderly as healthy as possible.(Mangoni & Jackson, 2004)

The development of medications for diseases, which occur more common in the elderly, is of significant interest. With the ageing of society, the prevalence of several diseases will increase. Nowadays, many companies are doing research in these areas and the need for suitable medication will increase in the future.(Pharmaceutical Research and Manufacturers of America)

1.2 India: An ageing nation

Elderly or geriatric population consists of ages nearing or surpassing the average life span of human beings. The social category of ‘old age’ is extremely broad and is referred to as population in their ‘late adulthood’, ‘the late decades of life’ or ‘the Third Age’.(C. Degnen, 2007) “The geriatric population is defined as population aged 60 years and above.”(Elango S., 1998).

The population over 60 years of age has tripled in last 50 years in India. As per Census 2011 data, the total geriatric population of India was 10,38,49,040. “The proportion of the population aged 60 years and above was 7 per cent in 2009 (88 million) and is expected to

increase to 20 per cent (315 million) by the year 2050. The oldest-old age segment (80 years and above) is the fastest-growing segment and by 2050, about 20 per cent of older persons will be 80 years and above. The coming decades therefore are characterised by ageing of the aged.”(UNFPA, 2011). “The UN defines a country as ‘ageing’ where the proportion of people over 60 reaches 7 percent.”(Dr. Indira Jai Prakash, 1999) India can be thus considered “an ageing nation”.

1.3 Morbidity amongst the grey population:

“Demographic transition which involves a shift from high mortality/high fertility to low mortality/low fertility has produced pronounced results in the form of population aging. Decline in the young population proportion along-with increased life span of individuals due to reduced fertility and mortality rate has lead to an increased elderly people proportion in the total population. The life expectation at birth has shown an increase from 42 years in 1951-1960 to 58 years in 1986– 1990 which is recently projected to 67 years by 2011 – 2016 for males and 69 years for females in India. This shows an increase of about “9 years” in males and “11 years” in females over the 25 years period.”(Jaspinder, 2014) Even though life expectancy has increased, not all years gained are lived in good health. Indeed a healthy life that is expected years of life in “good” or “fairly good” health is actually lower than overall life expectancy(Allen, 2008)

Old age is characterised by irreversible physical and cognitive changes and the person becomes vulnerable to various disease, syndromes, and sickness. “Almost one-half (47 percent) of older Indians have at least one chronic disease such as asthma, angina, arthritis, depression, or diabetes.”**Invalid source specified.**

1.4 Issues associated with old age and Pharmacy

The ageing of the society comes along with several specific problems. The increased frailty of the elderly, the increasing prevalence of diseases (including co-morbidities) and the large numbers of drugs used per patient have a major impact on the health systems. The elderly are more at risk from the adverse effects of drugs but also their involvement in clinical trials has been limited so that rational prescribing both to maximise benefit and to reduce risk has been problematic (Chrome, 2003)

i. Adverse Drug Reaction

The rate of adverse drug reactions in elderly is higher than in other parts of the society, whereas about between 27.6 and 51% of the adverse drug reactions in elderly are preventable.(Thomas & Brennan, 2000)

ii. Co-Morbidity

The incidence of diseases increases with age. Many elderly have several different disorders at the same time. This re-occurrence of diseases can lead to problems. There is too little knowledge of the interference of different diseases, so this will be an important domain for research by industry and academics in the near future.(Wolff & Starfield, 2002)

iii. Polypharmacy

It is studied that in the elderly the percentage of medication without indication or a less than optimal indication, ranges between 55 and 59% of the prescriptions.(Lipton & Bero, 1992) This kind of Polypharmacy is problematic especially in the elderly because it increases unnecessary the risks of adverse drug reactions, geriatric syndromes (like cognitive impairment and delirium) and the health care costs.(Hanlon & Schmander, 2001)

2. Rationale:

2.1 Disease mapping: the need of the hour

As the elderly population is likely to increase in the future, and there is a definite shift in the disease pattern, i.e. from communicable to non-communicable, it is high time that the health care system gears itself to growing health needs of the elderly in an optimal and comprehensive manner. There is a definite need to emphasize the fact that disease and disability are not part of old age and help must be sought to address the health problems.

The concept of active and healthy ageing needs to be promoted among the elderly, which includes preventive, curative and rehabilitative aspects of health.(Mahajan, GJMEDPH 2013)

According to the estimates non communicable diseases will account for more than one-half of the disease burden in low-income countries and more than three-fourths in middle-income countries by 2030.(WHO, 2011)“In India, the disease profiles and its types are changing quite alarmingly. Also scarcity of epidemiological data on the overall prevalence of chronic diseases in India is also a major health-sector concern.”(Sabyasachi S. et al, 2015)

Prevalence of various ailments amongst elderly and middle aged population has a significant influence on their physical and psychological well-being. The mapping of morbidity pattern of these age group will help the in the planning of intervention, both medical and social, which in turn will improve the health status and thus quality of life of elderly people.(Joshi et al, 2003)

The mapping of morbidity pattern of these age group will help the in the planning of intervention in terms of introduction of new molecules and medical equipment to improve the health status and thus quality of life of elderly people. The study was conducted to determine various ailments affecting the health of the elderly which can be used as background research by Pharmacy companies

3. Objectives of the research

- i. To identify the emerging ailments resulting in hospitalization as well as OPD consultations in geriatric age group
- ii. To determine the ailments for which geriatric specific medications need to be developed

4.Methodology

For the purpose of the research, data was taken from 60th round, schedule 25 of National Sample Survey on “Morbidity, Health and condition of the aged” conducted in 2004 which covers 47,302 rural and 26,566 urban households; and 71st round, schedule 25 of National Sample Survey on “Social Consumption in India: Health” conducted in 2014 which covers 36,480 and 29,452 Rural and Urban households respectively. Analysis covers 15,026 individuals (5,909 in-patients and 9,117 out-patients) from 60th round and 17,764 individuals (9,554 in-patients and 8,210 out-patients) from 71st round who have undergone hospitalization in last 365 days (in-patients) and who took medical consultation from doctor in last 15 days (out-patients) prior to start of the surveys. Following parameters were selected for desired households from different blocks of the questionnaire:

- i. Unique ID
- ii. Sector
- iii. Type of ailment for which the individual hospitalized
- iv. Type of ailment for which the individual took medical consultation

5.Findings

The social category of ‘old age’ is an extremely broad term and includes a spectrum of age groups over 60 years. “The incidence of acute, chronic and mental illness also peaks in old age with sharpest increase in those over 75. Infact older people account for a high proportion of hospitalizations, including multiple hospital admissions”(Sona et al., 2012)

To get a deeper understanding of their disease pattern, the geriatric age group was divided in to three sub-groups: (i) 60 to 69 years and (ii) 70 to 79 years and (iii) 80 years and above for both in-patient admissions and out-patient consultations.

5.1 In-Patient Profile

The disease profile for the first geriatric sub-group i.e. 60 to 69 years has been represented in Table 1. The table clearly shows the changes in the prevalence of diseases leading to hospitalization of individuals during the reference period (2004 to 2014).

Table 1. In-patient Disease Profile for age group 60 - 69 years						
Disease	2004		2014		% increase	
	Rural	Urban	Rural	Urban	Rural	Urban
Infection	29.68%	21.79%	16.14%	11.10%	-13.54%	-10.69%
Cancer	3.59%	4.06%	3.88%	5.57%	0.28%	1.51%
Blood Disorder	0.59%	0.53%	1.38%	1.19%	0.79%	0.66%
Goitre & Thyroid	0.10%	0.08%	0.19%	0.28%	0.09%	0.20%
Lifestyle	6.74%	12.62%	7.53%	10.55%	0.79%	-2.07%
Nutrition	0.10%	0.08%	0.30%	0.12%	0.20%	0.04%
Mental & Neuro	5.07%	4.43%	7.83%	8.18%	2.76%	3.75%
Eye	13.14%	10.82%	11.00%	8.61%	-2.14%	-2.21%
Ear	0.00%	0.08%	0.30%	0.12%	0.30%	0.04%
CVS	6.45%	14.05%	9.62%	14.97%	3.17%	0.92%
Respiratory	8.81%	8.11%	7.83%	7.19%	-0.98%	-0.92%
Gastro	5.86%	2.93%	10.14%	8.10%	4.28%	5.17%
Skin	0.59%	0.30%	1.60%	1.03%	1.01%	0.73%
Musculo-Skeletal	5.31%	5.79%	7.90%	6.01%	2.59%	0.22%
Genito-Urinary	6.40%	8.79%	6.11%	5.57%	-0.29%	-3.22%
Obstetric	0.00%	0.00%	0.04%	0.04%	0.04%	0.04%
Injuries	7.58%	5.56%	8.24%	11.38%	0.66%	5.82%

The decrement in the hospitalization due to infections remains to be in a trend as in pre-geriatric population, which is clearly indicative of reduction in hospital admissions due to

communicable diseases in urban as well as rural areas. A significant increase in the hospitalization cases due to mental and neurological ailments by 3% in rural and 4% in urban areas has been noted. It is notable that Lifestyle disorders showed an increment of 1% in rural areas whereas a decrement of 2% in urban areas. Sharp increase in the cases of Injuries by 6% was a major cause for hospitalization in urban areas. Although ailments of eye, respiratory system and genito-urinary tract are prevalent, a reduction in the hospitalization due to them has been observed.

The disease profile for the second geriatric sub-group i.e. 70 to 79 years has been represented in Table 2. The trend of decreased hospitalization due to infection (communicable disease) continues to remain with a decrement of almost 13% and 14% in rural and urban areas respectively. A consequential increase in the cases of mental and neurological ailments by almost 6% in rural areas and 4% in urban areas is observed.

Table 2. In-patient Disease Profile for age group 70 - 79 years						
Disease	2004		2014		% increase	
	Rural	Urban	Rural	Urban	Rural	Urban
Infection	26.30%	22.94%	13.33%	8.60%	-12.97%	-14.35%
Cancer	2.33%	3.37%	2.61%	3.86%	0.28%	0.49%
Blood Disorder	0.27%	0.50%	1.81%	1.26%	1.54%	0.77%
Goitre & Thyroid	0.09%	0.00%	0.40%	0.44%	0.31%	0.44%
Lifestyle	5.39%	11.85%	7.77%	11.57%	2.38%	-0.28%
Nutrition	0.18%	0.00%	0.07%	0.44%	-0.11%	0.44%
Mental & Neuro	4.04%	4.99%	9.85%	9.04%	5.81%	4.05%
Eye	16.16%	9.35%	10.18%	8.41%	-5.98%	-0.94%
Ear	0.09%	0.00%	0.27%	0.06%	0.18%	0.06%
CVS	7.27%	16.21%	11.39%	15.36%	4.12%	-0.85%
Respiratory	9.61%	7.98%	10.65%	9.36%	1.04%	1.38%
Gastro	5.03%	2.87%	7.17%	8.03%	2.14%	5.16%
Skin	1.08%	0.37%	1.41%	0.57%	0.33%	0.19%
Musculo-Skeletal	6.19%	6.61%	7.50%	5.88%	1.31%	-0.73%
Genito-Urinary	8.26%	7.11%	5.56%	6.76%	-2.70%	-0.34%
Obstetric	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Injuries	7.72%	5.86%	10.05%	10.37%	2.33%	4.51%

Similarly hospitalization cases due to cancer, blood disorders, ear ailments, gastro-intestinal tract disorders, skin ailments and injuries have also increased irrespective of the area. However, gastro-intestinal hospitalization shows a significant increase of more than 5% in

urban areas. In contrast to the other age groups a significant increase in the cases of respiratory ailments were noted for the first time in this age group. Cases due to nutritional disorders have decreases in the rural areas but increased in urban areas. Although significant number of cases are hospitalized due to eye and genito-urinary ailments but their incidence has reduced during the reference period. Similarly, cases due ailments of the eye has reduced but are still prevalent in significant proportion. Cases of hospitalization due to Lifestyle disorders and cardio-vascular ailments have shown decrement in the urban areas.

The disease profile for the third geriatric sub-group i.e. 80 years and above, also called the ‘oldest old’ has been represented in Table 3. It has been observed that the hospitalization cases due to infection have reduced by more than 14% in rural and 6% in urban areas, suggesting a reduced burden of communicable diseases on inpatient admissions.

Table 3. In-patient Disease Profile for age group Above 80 years						
Disease	2004		2014		% increase	
	Rural	Urban	Rural	Urban	Rural	Urban
Infection	27.67%	18.02%	13.23%	11.98%	-14.43%	-6.05%
Cancer	0.86%	2.83%	3.85%	2.99%	2.99%	0.17%
Blood Disorder	0.00%	1.41%	2.01%	1.50%	2.01%	0.08%
Goitre & Thyroid	0.29%	0.00%	0.34%	0.30%	0.05%	0.30%
Lifestyle	6.92%	7.07%	7.04%	10.48%	0.12%	3.41%
Nutrition	0.29%	0.00%	0.17%	0.30%	-0.12%	0.30%
Mental & Neuro	5.48%	3.18%	12.06%	11.98%	6.58%	8.80%
Eye	11.24%	8.13%	4.86%	5.09%	-6.38%	-3.04%
Ear	0.00%	0.35%	0.00%	0.15%	0.00%	-0.20%
CVS	6.34%	19.79%	10.22%	15.72%	3.88%	-4.07%
Respiratory	14.12%	11.31%	11.39%	10.93%	-2.73%	-0.38%
Gastro	4.61%	3.53%	5.19%	6.44%	0.58%	2.90%
Skin	0.00%	0.00%	1.84%	0.60%	1.84%	0.60%
Musculo-Skeletal	7.20%	5.30%	5.70%	5.09%	-1.51%	-0.21%
Genito-Urinary	8.93%	6.71%	6.03%	5.69%	-2.90%	-1.03%
Obstetric	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Injuries	6.05%	12.37%	16.08%	10.78%	10.03%	-1.59%

It is noteworthy that there is an alarming increase in the cases of cancer especially in the rural areas for this age group. Cases due to mental and neurological ailments have increased consequentially by almost 7% in rural and 8% in urban areas. A significant increase of 10 in the cases of injuries in the rural area was observed, however such cases decreased in the

urban area during the reference period. Although lifestyle disorders and Gastro-intestinal ailments have increased in both rural and urban sectors but they show a sharp significant increase in the urban areas. Hospitalization cases due to respiratory, musculo-skeletal and genito-urinary ailments are significant in number but their incidence has decreased during the reference period.

The overall disease profile for the geriatric population has been represented in Table 4. The table clearly shows that there is a significant decrease in cases of hospitalization due to communicable diseases across all age groups. It is significant to note that as we progress in the age group, incidence of hospitalization cases for almost all ailments tend to show an increase. However, in the “Oldest Old” or individuals above 80 years of age who have shown a significant increase in a number of ailments like, hospitalization cases due to cancer and injuries have shown an increase of almost 3% and 10% in rural areas. Mental and Neuro hospitalization cases have shown a drastic increment of almost 7% in rural and 9% in urban areas. Cases of lifestyle related hospitalization have also increased in this age group in urban areas

Table 4. In-patient Disease Profile for Geriatric Age Group

Disease	60 - 69 yrs				70 - 79 yrs				Above 80 yrs			
	2004		2014		2004		2014		2004		2014	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Infection	29.68%	21.79%	16.14%	11.10%	26.30%	22.94%	13.33%	8.60%	27.67%	18.02%	13.23%	11.98%
Cancer	3.59%	4.06%	3.88%	5.57%	2.33%	3.37%	2.61%	3.86%	0.86%	2.83%	3.85%	2.99%
Blood Disorder	0.59%	0.53%	1.38%	1.19%	0.27%	0.50%	1.81%	1.26%	0.00%	1.41%	2.01%	1.50%
Goitre & Thyroid	0.10%	0.08%	0.19%	0.28%	0.09%	0.00%	0.40%	0.44%	0.29%	0.00%	0.34%	0.30%
Lifestyle	6.74%	12.62%	7.53%	10.55%	5.39%	11.85%	7.77%	11.57%	6.92%	7.07%	7.04%	10.48%
Nutrition	0.10%	0.08%	0.30%	0.12%	0.18%	0.00%	0.07%	0.44%	0.29%	0.00%	0.17%	0.30%
Mental & Neuro	5.07%	4.43%	7.83%	8.18%	4.04%	4.99%	9.85%	9.04%	5.48%	3.18%	12.06%	11.98%
Eye	13.14%	10.82%	11.00%	8.61%	16.16%	9.35%	10.18%	8.41%	11.24%	8.13%	4.86%	5.09%
Ear	0.00%	0.08%	0.30%	0.12%	0.09%	0.00%	0.27%	0.06%	0.00%	0.35%	0.00%	0.15%
CVS	6.45%	14.05%	9.62%	14.97%	7.27%	16.21%	11.39%	15.36%	6.34%	19.79%	10.22%	15.72%
Respiratory	8.81%	8.11%	7.83%	7.19%	9.61%	7.98%	10.65%	9.36%	14.12%	11.31%	11.39%	10.93%
Gastro	5.86%	2.93%	10.14%	8.10%	5.03%	2.87%	7.17%	8.03%	4.61%	3.53%	5.19%	6.44%
Skin	0.59%	0.30%	1.60%	1.03%	1.08%	0.37%	1.41%	0.57%	0.00%	0.00%	1.84%	0.60%
Musculo-Skeletal	5.31%	5.79%	7.90%	6.01%	6.19%	6.61%	7.50%	5.88%	7.20%	5.30%	5.70%	5.09%
Genito-Urinary	6.40%	8.79%	6.11%	5.57%	8.26%	7.11%	5.56%	6.76%	8.93%	6.71%	6.03%	5.69%
Obstetric	0.00%	0.00%	0.04%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Injuries	7.58%	5.56%	8.24%	11.38%	7.72%	5.86%	10.05%	10.37%	6.05%	12.37%	16.08%	10.78%

5.2 Out-Patients

Out-patient disease profile was prepared on similar pattern. The out-patient disease profile for the age group 60-69 years has been represented in Table 5.

Table 5. Out-patient Disease Profile for age group 60 - 69 years						
Disease	2004		2014		% increase	
	Rural	Urban	Rural	Urban	Rural	Urban
Infection	17.37%	4.67%	10.87%	4.73%	-6.50%	0.06%
Cancer	1.08%	0.23%	0.13%	0.19%	-0.95%	-0.04%
Blood Disorder	0.64%	0.00%	0.52%	0.65%	-0.12%	0.65%
Goitre & Thyroid	0.11%	0.00%	0.69%	1.42%	0.58%	1.42%
Lifestyle	14.78%	42.29%	32.60%	54.15%	17.82%	11.86%
Nutrition	0.04%	0.00%	0.00%	0.00%	-0.04%	0.00%
Mental & Neuro	3.92%	0.93%	5.35%	3.85%	1.42%	2.91%
Eye	9.84%	5.14%	1.98%	0.92%	-7.86%	-4.22%
Ear	2.06%	1.17%	0.82%	0.15%	-1.24%	-1.01%
CVS	4.58%	11.92%	5.35%	5.35%	0.77%	-6.57%
Respiratory	13.23%	13.08%	11.38%	7.54%	-1.85%	-5.55%
Gastro	7.25%	2.34%	5.35%	3.15%	-1.90%	0.82%
Skin	1.97%	1.17%	1.55%	1.08%	-0.42%	-0.09%
Musculo-Skeletal	18.89%	14.25%	20.53%	12.54%	1.63%	-1.71%
Genito-Urinary	1.82%	1.87%	0.82%	0.69%	-1.00%	-1.18%
Obstetric	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Injuries	2.42%	0.93%	2.07%	3.58%	-0.35%	2.64%

Cases of infection have reduced notably in rural areas but a very marginal increase of 0.06% is observed in urban areas. OPD (Out-Patient Department) consultations for Lifestyle disorders have increased remarkably in past ten years by 18% and 12% in rural and urban areas respectively. Another major ailment observed is Mental and Neurological disorders which has increased by almost 1.5% and 3% for rural and urban areas respectively. Consultations for Cardio Vascular disorders, Musculo-skeletal like arthritis have increased in rural areas whereas gastrointestinal disorders, injuries have decreased in rural areas. This decrement can be co-related to the increase in in-patient admissions for the same ailments.

The disease profile for second age-group i.e. 70-79 years is represented in table 6.

Table 6. Out-Patient Disease Profile for age group 70 - 79 years						
Disease	2004		2014		% increase	
	Rural	Urban	Rural	Urban	Rural	Urban
Infection	11.44%	4.61%	8.65%	3.86%	-2.78%	-0.74%
Cancer	0.88%	1.97%	0.00%	0.47%	-0.88%	-1.50%
Blood Disorder	0.23%	0.00%	0.26%	1.02%	0.03%	1.02%
Goitre & Thyroid	0.19%	0.33%	0.17%	0.79%	-0.02%	0.46%
Lifestyle	13.51%	34.54%	31.03%	49.88%	17.52%	15.34%
Nutrition	0.08%	0.00%	0.00%	0.00%	-0.08%	0.00%
Mental & Neuro	3.49%	0.99%	5.33%	2.99%	1.84%	2.01%
Eye	13.43%	5.59%	2.88%	1.65%	-10.55%	-3.94%
Ear	3.88%	0.33%	0.52%	0.55%	-3.35%	0.22%
CVS	4.80%	9.21%	5.07%	6.86%	0.27%	-2.35%
Respiratory	13.81%	12.17%	14.86%	7.96%	1.05%	-4.21%
Gastro	5.10%	1.97%	4.46%	3.55%	-0.65%	1.57%
Skin	1.50%	1.64%	1.84%	1.02%	0.34%	-0.62%
Musculo-Skeletal	22.37%	21.71%	20.54%	14.97%	-1.83%	-6.74%
Genito-Urinary	2.07%	2.96%	0.87%	0.55%	-1.20%	-2.41%
Obstetric	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Injuries	3.22%	1.97%	3.50%	3.86%	0.27%	1.89%

Cases of OPD consultations for infection have reduced significantly in the age group 70-79 years for both rural and urban areas. Similar to the previous age group, consultations for lifestyle disorders have increased remarkably by almost 18% in rural and 15% in urban areas during the reference period (2004 to 2014). Mental and Neurological disorders is another group of ailments that have increased significantly by almost 2% in both rural and urban areas in last ten years. Cases of Cardio Vascular and respiratory consultations have increased in rural areas whereas gastrointestinal disorder and consultations for injuries have increased in urban areas.

Table 7. Out-patient Disease Profile for age group above 80 years						
Disease	2004		2014		% increase	
	Rural	Urban	Rural	Urban	Rural	Urban
Infection	10.45%	0.00%	9.71%	4.72%	-0.74%	4.72%
Cancer	0.54%	1.48%	0.73%	0.43%	0.19%	-1.05%
Blood Disorder	0.65%	0.00%	0.97%	0.64%	0.32%	0.64%
Goitre & Thyroid	0.00%	0.00%	0.73%	1.72%	0.73%	1.72%
Lifestyle	11.31%	28.89%	29.61%	46.35%	18.30%	17.46%
Nutrition	0.11%	0.00%	0.00%	0.00%	-0.11%	0.00%
Mental & Neuro	4.96%	0.74%	6.55%	3.86%	1.60%	3.12%
Eye	15.84%	3.70%	3.64%	2.36%	-12.20%	-1.34%
Ear	5.28%	10.37%	1.46%	0.43%	-3.82%	-9.94%
CVS	2.80%	13.33%	4.85%	7.30%	2.05%	-6.04%
Respiratory	13.79%	7.41%	10.19%	9.66%	-3.60%	2.25%
Gastro	4.74%	1.48%	3.64%	2.58%	-1.10%	1.09%
Skin	0.75%	0.74%	1.70%	0.86%	0.94%	0.12%
Musculo-Skeletal	22.20%	28.15%	21.12%	14.38%	-1.08%	-13.77%
Genito-Urinary	4.85%	0.74%	0.73%	0.86%	-4.12%	0.12%
Obstetric	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Injuries	1.72%	2.96%	4.37%	3.86%	2.64%	0.90%

For the “oldest old” or above 80years age group, infections have increased significantly by 5% in urban areas. The major ailments in this age group are lifestyle disorders which have increased by 18% and 17% in rural and urban areas respectively and mental and neurological disorders which have shown an increment of almost 2% in rural and 3% in urban areas. Injuries have increase in both rural and urban areas whereas Cardio Vascular consultations have increased only in rural areas.

The complete disease profile for Out-Patients consultations for geriatric age group has been represented in table 8. The table represents that as far as OPD consultations are concerned, Lifestyle Disorders and Mental and Neurological Disorders have shown a significant increase in all the three age groups during the reference period. However case of infection have reduced during the reference period

Table 8. Out-patient Disease Profile for Geriatric age group												
Disease	60 - 69 years				70 - 79 years				Above 80 years			
	2004		2014		2004		2014		2004		2014	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Infection	17.37%	4.67%	10.87%	4.73%	11.44%	4.61%	8.65%	3.86%	10.45%	0.00%	9.71%	4.72%
Cancer	1.08%	0.23%	0.13%	0.19%	0.88%	1.97%	0.00%	0.47%	0.54%	1.48%	0.73%	0.43%
Blood Disorder	0.64%	0.00%	0.52%	0.65%	0.23%	0.00%	0.26%	1.02%	0.65%	0.00%	0.97%	0.64%
Goitre & Thyroid	0.11%	0.00%	0.69%	1.42%	0.19%	0.33%	0.17%	0.79%	0.00%	0.00%	0.73%	1.72%
Lifestyle	14.78%	42.29%	32.60%	54.15%	13.51%	34.54%	31.03%	49.88%	11.31%	28.89%	29.61%	46.35%
Nutrition	0.04%	0.00%	0.00%	0.00%	0.08%	0.00%	0.00%	0.00%	0.11%	0.00%	0.00%	0.00%
Mental & Neuro	3.92%	0.93%	5.35%	3.85%	3.49%	0.99%	5.33%	2.99%	4.96%	0.74%	6.55%	3.86%
Eye	9.84%	5.14%	1.98%	0.92%	13.43%	5.59%	2.88%	1.65%	15.84%	3.70%	3.64%	2.36%
Ear	2.06%	1.17%	0.82%	0.15%	3.88%	0.33%	0.52%	0.55%	5.28%	10.37%	1.46%	0.43%
CVS	4.58%	11.92%	5.35%	5.35%	4.80%	9.21%	5.07%	6.86%	2.80%	13.33%	4.85%	7.30%
Respiratory	13.23%	13.08%	11.38%	7.54%	13.81%	12.17%	14.86%	7.96%	13.79%	7.41%	10.19%	9.66%
Gastro	7.25%	2.34%	5.35%	3.15%	5.10%	1.97%	4.46%	3.55%	4.74%	1.48%	3.64%	2.58%
Skin	1.97%	1.17%	1.55%	1.08%	1.50%	1.64%	1.84%	1.02%	0.75%	0.74%	1.70%	0.86%
Musculo-Skeletal	18.89%	14.25%	20.53%	12.54%	22.37%	21.71%	20.54%	14.97%	22.20%	28.15%	21.12%	14.38%
Genito-Urinary	1.82%	1.87%	0.82%	0.69%	2.07%	2.96%	0.87%	0.55%	4.85%	0.74%	0.73%	0.86%
Obstetric	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Injuries	2.42%	0.93%	2.07%	3.58%	3.22%	1.97%	3.50%	3.86%	1.72%	2.96%	4.37%	3.86%

3.6 Conclusion:

The conclusive table for in-patient admissions and out-patient consultations have been represented in table 9.

Table 9. Disease Profile for Geriatric age group								
Disease	Out - Patients				In - Patients			
	2004		2014		2004		2014	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Infection	14.72%	3.92%	10.09%	4.48%	28.40%	21.73%	14.90%	10.40%
Cancer	0.96%	1.04%	0.15%	0.30%	2.92%	3.68%	3.48%	4.64%
Blood Disorder	0.51%	0.00%	0.49%	0.76%	0.43%	0.62%	1.59%	1.25%
Goitre & Thyroid	0.12%	0.12%	0.54%	1.27%	0.11%	0.04%	0.27%	0.33%
Lifestyle	13.99%	37.49%	31.82%	52.06%	6.33%	11.71%	7.54%	10.88%
Nutrition	0.06%	0.00%	0.00%	0.00%	0.14%	0.04%	0.21%	0.25%
Mental & Neuro	3.90%	0.92%	5.47%	3.60%	4.78%	4.47%	8.99%	8.99%
Eye	11.65%	5.07%	2.43%	1.29%	13.91%	10.02%	9.97%	8.05%
Ear	2.99%	2.31%	0.80%	0.30%	0.03%	0.08%	0.25%	0.10%
CVS	4.45%	11.19%	5.21%	6.00%	6.70%	15.44%	10.25%	15.21%
Respiratory	13.48%	11.88%	12.28%	7.89%	9.59%	8.44%	9.16%	8.43%
Gastro	6.29%	2.08%	4.90%	3.21%	5.47%	2.98%	8.59%	7.84%
Skin	1.68%	1.27%	1.65%	1.04%	0.69%	0.29%	1.57%	0.82%
Musculo-Skeletal	20.36%	19.03%	20.59%	13.45%	5.78%	6.00%	7.50%	5.84%
Genito-Urinary	2.24%	2.08%	0.83%	0.67%	7.24%	7.99%	5.93%	5.98%
Injuries	2.59%	1.61%	2.74%	3.69%	7.47%	6.46%	9.78%	10.96%

Major diseases for Out-patient consultations are:

- (i) Lifestyle Disorders
- (ii) Mental and Neurological Disorders
- (iii) Musculo-Skeletal Disorders
- (iv) Respiratory Disorders
- (v) Infection

Major disorders for In-patient admissions are:

- (i) Infection
- (ii) Cardiovascular Disorders
- (iii) Injuries
- (iv) Lifestyle Disorders
- (v) Mental and Neurological Disorders

This is indicative of promising market segments for the development of new molecules as well medical equipments related to the above mentioned disorders.

The unhealthy population is increasing in India, as the trend depicts when disease profile is compared over a period of ten years. The life span has increased but the population is spending more of sick years rather than healthy years as the age increases.

Burden of Non Communicable Diseases will not only affect the health of the elderly individuals, but also the productivity and economic growth of the nation. “The evidence is compelling. India stands to lose \$4.58 trillion before 2030 due to NCDs and mental health conditions. Cardiovascular diseases, accounting for \$2.17 trillion and mental health conditions (\$1.03 trillion), will lead the way in economic loss.” (World Economic Forum, 2014)

Infectious diseases have decreased because of a better public health intervention in health care over a period of ten years. But there is a consequential increase in the burden due to Non-communicable disease. Amongst them Mental and neurological ailments, Chronic respiratory diseases and lifestyle disorders are the main categories. Injuries have also increased over a period of ten years as risk has increased. The geriatric population has become more prone to injuries. This gives a clear indication that disabilities in this population would be increasing as a result of the above mentioned non communicable diseases.

The changing scenario in terms of the disease prevalence is a major factor affecting markets in individual countries and thus have a major implication on pharmaceutical industry as well. The trend of increase in the load of chronic and non-communicable diseases demands an urgent attention for research and development of molecules in this area.

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